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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Masayoshi Shimizu

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EXAMINER

TUCKER, WESLEY J

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/957,032	<b>Applicant(s)</b> SHIMIZU, MASAYOSHI	
	<b>Examiner</b> WESLEY TUCKER	<b>Art Unit</b> 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 14, 15, 17-19 and 32-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 14, 15, 17-19 and 32-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6-5-08</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed August 6<sup>th</sup> 2008 has been entered and made of record.

2. Applicant has not amended any claims. Claims 2-13, 16, 20-24, 27-31 and 37-38 have been withdrawn or cancelled. Claims 1, 14, 15, 17-19 and 32-36 remain pending.

3. Applicant's arguments in view of the presented claims have been fully considered but are not found persuasive for at least the following reasons:

Applicant argues that the reference to Fuss does not disclose dividing an image based on tone or dividing the image into local areas. Examiner disagrees and points to the previously cited passages of Fuss again. The goal of Fuss is to enhance both global and local contrast and to do so according to local and global image tone information (column 6, lines 55-67). The term "tone level" is a fairly broad term in image processing that refers generally to either color or luminance/intensity or a combination of the two. Therefore, since the goal of Fuss is to enhance both local and global contrast, and since contrast adjustments are essentially performed according to tone level values (which is reasonably broadly interpreted as either color or luminance/intensity or a combination of the two) it is certainly reasonable to combine Fuss with the reference to Nakai who teaches dividing an image into sub-images according to tone or color data so that the sub-image may be enhanced separately

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(column 5, lines 50-61 and column 6, lines 46-58). The practice of dividing an image according to content so that the images portions may be operated on specifically according to desired effect is well known in the art. Furthermore, Applicant argues that Fuss teaches away from dividing the image into areas according to tone. Examiner disagrees. Fuss explicitly teaches that the divided sub-images are “not necessarily identical in size or ordered in any fashion and histograms from each local area are derived” (column 6, lines 58-61). It would be exceedingly obvious to one ordinary skill in the art to divide the image according to tone when seeking to enhance both local and global contrast and especially in view of the explicit teaching of Nakai to divide an image according to tone or color.

Applicant also argues that Fuss teaches away from using all of the histograms or the claimed feature of: “computing a statistic amount for estimation of the tone color value level of a whole of the original image using the characteristic amounts for each of the plurality of sub-areas.” Applicant argues that because Fuss teaches using only a subset of the area histograms, Fuss teaches away from combining all of the characteristic amounts. Examiner disagrees and points to column 8, lines 5-45, where Fuss clearly teaches many different ways of using the histograms for the areas including weighting all relevant histograms. In the method of Fuss, the histograms are determined to be relevant if they mathematically represent a certain range of tone or image values. So this practice is still interpreted to be a computation of “a statistic amount for estimation of the tone color value level of a whole of the original image using the characteristic amounts for each of the plurality of sub-areas.” Each of the sub-area

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amounts are considered in computing the overall characteristic amount. Each of the characteristic amounts is used because they are examined, but depending on the calculation, some of the regions are discarded or effectively weighted to zero. Broadly interpreted, the references to Fuss and Nakai are considered to disclose the claim language as recited. The rejection is therefore maintained and made FINAL

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 14, 17-18, 32-33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,581,370 to Fuss et al. and 5,539,523 to Nakai et al.

With regard to claim 1, Fuss discloses an image tone level estimating method for estimating a tone level of an image, comprising:

Dividing an original image into a plurality of image sub-areas according to tone level information (column 6, lines 57-67);

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Computing a characteristic amount for each of the plurality of sub-areas producing characteristics amounts (column 7, lines 34-65); and

Computing a statistic amount for estimation of the tone color value level of a whole of the original image using the characteristic amounts for each of the plurality of sub-areas (column 8, lines 20-30).

Fuss discloses dividing an image into smaller sub-images and calculating histograms for each of the smaller histograms. The histograms themselves are interpreted as characteristic amounts for each of the sub-areas. Fuss also discloses that a variance is calculated for each histogram. Fuss then also calculates a statistic amount for enhancing tone scale or contrast based on all of the histograms. The luminance values used by Fuss are interpreted as tone level information. In one particular embodiment, Fuss discloses that all of the histograms are combined as a weighted sum to create a global relevant histogram taking into account the histograms that are most relevant according to their variance compared with a global variance value. Both the global histogram and the global variance determined for the weighted combination of histograms are considered statistic amounts.

The goal of Fuss is to enhance both global and local contrast and to do so according to local and global image tone information (column 6, lines 55-67). Fuss also teaches that the divided sub-images are “not necessarily identical in size or ordered in any fashion and histograms from each local area are derived” (column 6, lines 58-61). One of ordinary skill in the art would understand that the most effective sub-image division for Fuss would be according to content so that each sub-image may have its

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contrast enhanced according to content. Nakai et al. is cited to teach dividing an image into sub-images according to tone or color data so that the sub-image may be enhanced separately (column 5, lines 50-61 and column 6, lines 46-58). It would have been obvious to one of ordinary skill in the art to divide an image into sub-images according to content tone/color data as taught by Nakai to better enhance the individual sub-images in the image contrast enhancement taught by Fuss.

With regard to claim 14, the discussion of claim 1 applies. Fuss discloses the steps of claim 1 repeated in claim 14 as well as the final step of:

comparing the statistic amount with a predetermined value (column 10, lines 44-67). Fuss discloses that the global histogram calculated from the relevant histograms or the weighted sum of histograms of the sub-areas is used to determine the global histogram statistical value and that value is compared to a threshold.

Fuss further discloses determining a correcting parameter based on the comparison result; and correcting the original image using the correcting parameter (column 10, lines 44-67). According to the comparison to the threshold mentioned above the histogram is adjusted in a certain way. For example the threshold of 50 is used to determine whether the variance is low, high or moderate. Then the compensation of the histogram is determined, which is mapped to the output.

With regard to claim 17, the discussions of claims 1 and 14 above apply. Fuss discloses an apparatus for performing the steps discussed above (column 11, lines 7-13).

With regard to claim 18, Fuss discloses the apparatus according to claim 17, further comprising a weight coefficient for each area, wherein said statistic amount computation unit computes the statistic amount using the characteristic amount for each area and the weight coefficient for each area (column 8, lines 20-27).

With regard to claim 32, the discussion of claim 1 applies. Fuss discloses a computer readable medium (column 11, lines 7-13).

With regard to claim 33, the discussion of claim 14 applies.

With regard to claims 35 and 36, the discussions of claims 1 and 14 apply.

5. Claims 15, 19 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 5,581,370 to Fuss and 5,539,523 to Nakai et al. and further in view of Katajamaki et al. ("Image Dependent Gamma Selection Based on Color Palette Equalization and a Simple Lightness Model"). The arguments as to the relevance of Fuss as applied above are incorporated herein.



With regard to claim 15, Fuss discloses using a correcting parameter to generate a corrected image. Fuss further discloses determining a correcting parameter by comparing a computed statistic amount with a predetermined value. Fuss fails to expressly disclose correcting the original image using a plurality of different correcting parameters to generate a plurality of corrected images. It follows that Fuss also fails to expressly disclose determining that the correction result is the corrected image obtained using the correcting parameter corresponding to the statistic amount closest to a predetermined value.

Katajamaki, on the other hand, discloses generating a plurality of corrected images by correcting an original image using a plurality of different correcting parameters (Katajamaki pg. 303: The reference describes using different values of a variable 'f' (i.e. a plurality of different correcting parameters) to generate a plurality of corrected images from an original image).

Katajamaki further discloses defining a corrected image obtained using a correcting parameter (in this case the optimal value (or correcting parameter) was 12) corresponding to a statistic amount closest to a predetermined value among the computed statistic amounts as an appropriate corrected image (Katajamaki pg. 303: again, the reference describes determining the parameter which produces the optimum result (i.e. defining a corrected image) by minimizing a root mean square error value (i.e. the computed statistic amount which was closest to a predetermined value for the statistic amount)).

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Fuss' image correcting method by generating a plural corrected images from plural correcting parameters and then determining the appropriate parameter and corresponding image by minimizing some predetermined error index as taught by Katajamaki. Such a modification would have allowed for an iterative image correction algorithm well suited for computer processing. It also would have allowed for the option of using a reference image in the image correction process as an ideal image with which corrected images could be compared to.

With regard to claim 19, Fuss discloses an apparatus for performing the method of claim 15 (see Fuss column 11, lines 7-13).

With regard to claims 34, a computer-readable recording medium that stores a program which causes the computer to execute the steps of claims 1 and 14 is essential if the image processing method disclosed in Fuss is to function (see column 11, lines 7-13).

#### ***FINAL REJECTION***

6. Applicant's amendment necessitated the grounds of rejection presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Contact Information***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WESLEY TUCKER whose telephone number is (571)272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wes Tucker/  
Examiner, Art Unit 2624